2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action and alternatives to this action. The Proposed Action is to complete an exchange of the Bridger, JO Ranch and Welch lands for the federal coal beneath the PSO[1] Tract. It is assumed that the PSO Tract would be developed as a new mine. The lands which would be acquired in exchange for the coal would be managed by the USFS (Bridger lands within the BTNF) and BLM (Bridger lands outside the BTNF, JO Ranch and Welch lands).

The No Action Alternative (Alternative 1) is to not complete the exchange. Selection of this alternative would mean that the lands being offered for exchange would remain in private ownership and the federal coal underlying the PSO Tract would remain in federal ownership.

Other alternatives considered include:

- not exchanging or leasing the coal but purchasing the lands offered by P&M Coal for the appraised value (Alternative 2); and
- holding a competitive lease sale for federal coal in the PSO Tract, with the assumption that it would be developed as a new mine by any qualified bidder who acquires the lease (Alternative 3).

[1] Refer to page viii for a list of abbreviations and acronyms used in this document.

The exchange was proposed by P&M as a way to acquire coal beneath their surface in the PSO Tract. The lands they are offering in exchange are attractive to the federal government. The Bridger lands are in-holdings surrounded by BTNF and BLM lands and the JO Ranch lands are in-holdings surrounded by BLM lands. The Welch lands have considerable wildlife value and their acquisition would create a unique opportunity for the public to access the Tongue River in Sheridan County.

2.1 Proposed Action

Under the Proposed Action, the exchange would be completed and the Bridger, JO, and Welch lands would become public lands. P&M would acquire ownership of an amount of federal coal underlying the PSO Tract that would be equal in value to the properties they are offering for exchange.

The lands and minerals that would become public lands and minerals if the exchange is completed are described below.

Bridger Lands
Lincoln County, Wyoming

The legal description of the Bridger lands and mineral interests that P&M is offering to exchange (shown in Figure 1-2) is as follows:

Lands to be administered by BLM:
T. 26 N., R. 115 W., 6th PM, Wyoming
Tracts 49, 57, and 71;
Total: 638.37 acres more or less.

Lands to be administered by USFS:
T. 26 N., R. 116 W., 6th PM, Wyoming
Tracts 39, 41, and 42;

T. 26 N., R. 117 W., 6th PM, Wyoming
Tracts 37 through 43;

T. 27 N., R. 117 W., 6th PM, Wyoming
Tracts 37 through 42.
Total: 2,447.88 acres more or less.

Minerals to be administered by BLM:
T. 26 N., R. 115 W., 6th PM, Wyoming
Tracts 49, 57, and 71;
Total: 638.37 acres more or less.

Minerals to be administered by USFS:
T. 26 N., R. 116 W., 6th PM, Wyoming
Tracts 39, 41, and 42;

T. 26 N., R. 117 W., 6th PM, Wyoming
Tracts 37 through 43;

T. 27 N., R. 117 W., 6th PM, Wyoming
Tracts 37 through 42.
Total: 2,447.88 acres more or less.

The Bridger lands are surrounded by public lands and minerals administered by the BLM and the USFS. Under the proposed action, if these lands become public lands, the acquired surface and mineral estates would be managed like the surrounding public lands in accordance with the BLM *Pinedale Resource Management Plan* and the USFS *BTNF Land and Resource Management Plan*.

JO Ranch Lands
Carbon County, Wyoming

The legal description of the JO Ranch lands and mineral interests that P&M is offering to exchange (shown in Figure 1-3) is as follows:

Lands
T. 16 N., R. 90 W., 6th PM, Wyoming
Tract 46;
Section 6: Lots 20, 23, 24, 27, NE¼SW¼;
Section 17: SW¼SW¼;
Section 18: NE¼SE¼;

T. 16 N., R. 91 W., 6th PM, Wyoming
Section 12: NE¼NE¼, SW¼NE¼, SW¼SW¼, E½SW¼, W½SE¼;
Section 13: W½NW¼, SE¼NW¼, NW¼SW¼;
Section 14: SE¼NE¼, NE¼SE¼, S½SE¼;
Section 22: SE¼SE¼, SE¼SE¼SW¼SE¼;
Section 23: W½NE¼, S½NW¼, N½SW¼, SW¼SW¼.
Total: 1,236.47 acres more or less.

Minerals
P&M does not own and is not offering for exchange any of the minerals underlying the JO Ranch lands.

The JO Ranch lands are surrounded by public lands and minerals administered by the BLM. Under the proposed action, if these lands become public lands, future management of the acquired surface estate will be determined through additional NEPA analyses and planning decisions.

Welch Lands
Sheridan County, Wyoming

The legal description of the Welch lands and mineral interests that P&M is offering to exchange (shown in Figure 1-4) is as follows:

T. 57 N., R. 84 W., 6th PM, Wyoming
Section 1: S½NE¼, SE¼NW¼, N½SW¼, SW¼SW¼;
Section 2: Lots 2, 3, S½N½, S½;
Section 3: Lots 3,4, S½N½, N½S½, SE¼SE¼;
Section 4: Lots 1 through 4, S½NE¼, SE¼NW¼, N½SE¼.
Total: 1,600.41 acres more or less.

Minerals
P&M owns and is offering to exchange the coal rights underlying the following lands:

T. 57 N., R. 84 W., 6th PM, Wyoming
Section 1: S½NE¼, SE¼NW, SW¼SW¼;
Section 2: S½NW¼, S½;
Section 3: S½NE¼, SE¼NW¼, N½SW¼, SE¼SE¼.
Total: 800 acres.

P&M does not own and is not offering to exchange any other mineral rights underlying the Welch lands.

The Welch lands are surrounded by private lands and private and federal minerals. The federal minerals are administered by the BLM. Under the proposed action, if these lands are acquired the BLM Buffalo Field Office would determine future management of these lands through additional NEPA analyses and planning decisions.

PSO Tract
Sheridan County, Wyoming

The legal description of the federal coal being considered for exchange under the Proposed Action (the PSO Tract, shown in Figure 2-1) is as follows:

T.58N., R.84W., 6th P.M., Sheridan County, Wyoming

Section 15: Lot 1;
Section 20: SE¼;
Section 21: E½NE¼, S½;
Section 22: NW¼, W½SW¼;
Section 23: Lots 3 and 4;
Section 27: W½NW¼, W½SW¼;
Section 28: All
Section 29: NE¼, NE¼SE¼;
Section 33: N½NE¼;
Section 34: SW¼NE¼, NW¼NW¼.

Total selected area:
2,045.53 acres more or less.

The land description and acreage are based on the BLM Status of Public Domain Land and Mineral Title approved Coal Plat as of November 12, 1999. BLM is considering a thorough field investigation and conditional corrective resurvey in T.58N., R. 84W.

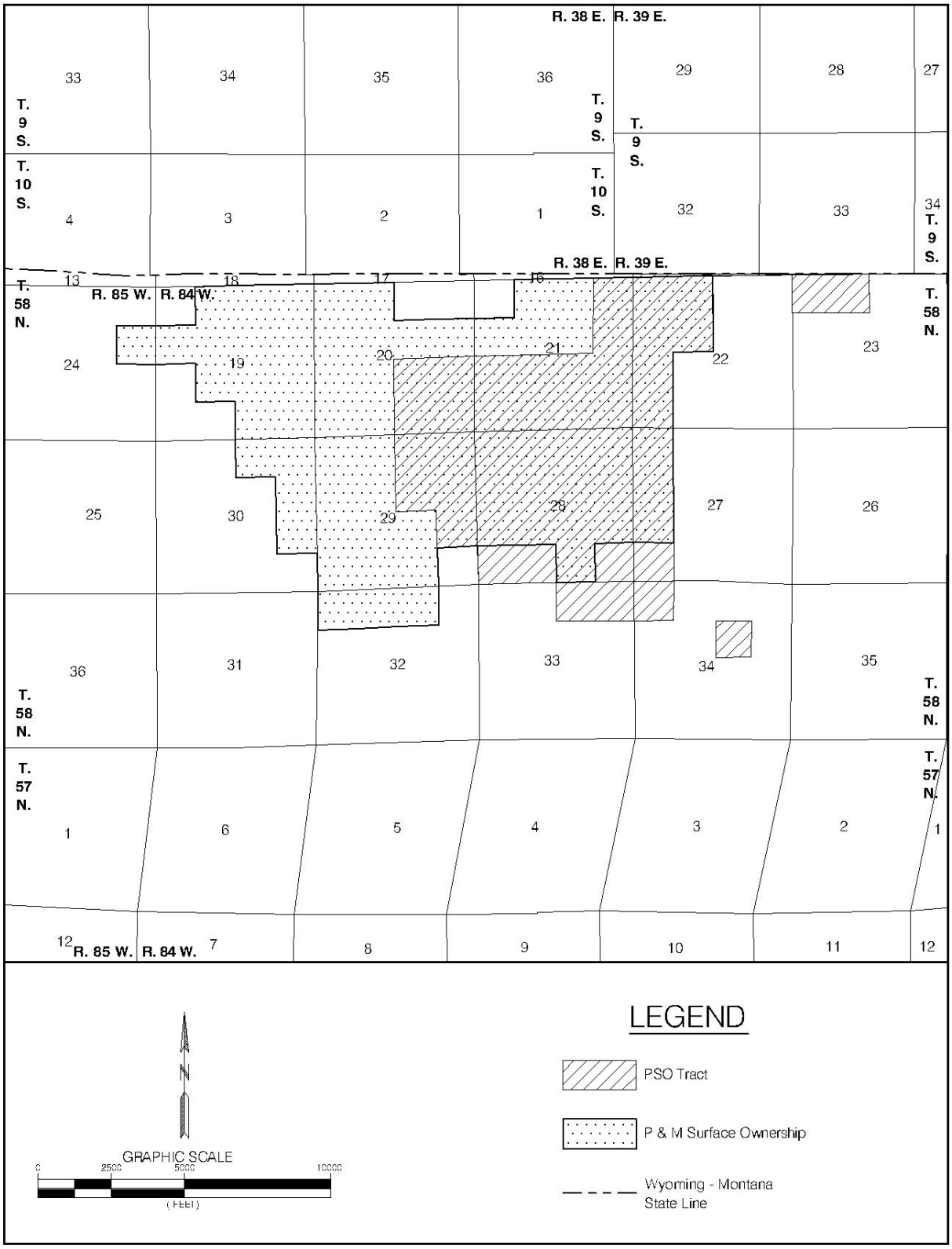

Figure 2-1. PSO Tract Configuration as Proposed.

after receiving information from a private surveyor in 2001 which indicates that the 1952 BLM dependent resurvey missed the original survey corners in this township. The corrective resurvey area would include the PSO Tract.

The Proposed Action assumes that the exchange will be completed and P&M will acquire and mine the federal coal included in the tract described above. For purposes of analysis, it is assumed that all the federal coal within the PSO Tract as proposed by P&M would be included in the exchange. The actual amount of coal that would be exchanged would depend upon the appraisal process.

If an exchange is completed, a detailed mining and reclamation plan would have to be developed and approved before P&M could begin mining on the tract. As part of the approval process, the mining and reclamation plan would undergo detailed review by state and federal agencies. The mining and reclamation plan would include monitoring and mitigation measures that are required by SMCRA and Wyoming State law. These monitoring and mitigation measures are considered to be part of the Proposed Action during the exchange process because they are regulatory requirements.

The final, detailed mining and reclamation plan which must be approved prior to initiation of mining could potentially differ from the plan used to analyze the impacts of the Proposed Action in this EIS. Figure 2-2 is a schematic mine plan prepared by P&M which is described below. The schematic mine plan shown in Figure 2-2 includes privately-owned coal which lies outside of the PSO tract and which is not included in the exchange proposal. The differences between the final, detailed mining and reclamation plan that P&M would be required to submit for approval prior to mining and the P&M's proposed mine plan shown in Figure 2-2 would not be expected to significantly change the impacts described in this EIS. These differences would typically be related to the details of mining and reclaiming the tract but major factors like tons of coal mined, yards of overburden removed, acres disturbed, etc. would not be significantly different from the plan used in this analysis.

Although the total area of the PSO Tract is about 2,045 acres, not all of this area contains coal that is economically recoverable under foreseeable conditions. Faulting, spontaneous combustion and other geologic factors have removed the coal or rendered it uneconomic to recover. The PSO Tract is not a single, contiguous tract of land (see Figure 1-5), and PSO's mine plans include mining the PSO Tract in conjunction with adjacent, privately-owned coal. P&M estimates that there are 153.2 million tons of mineable coal within the Mine Plan area, of which about 112.5 million tons are in the PSO Tract and are currently owned by the federal government. The total area to be mined under P&M's proposed mine plan is about 1,720 acres, of which

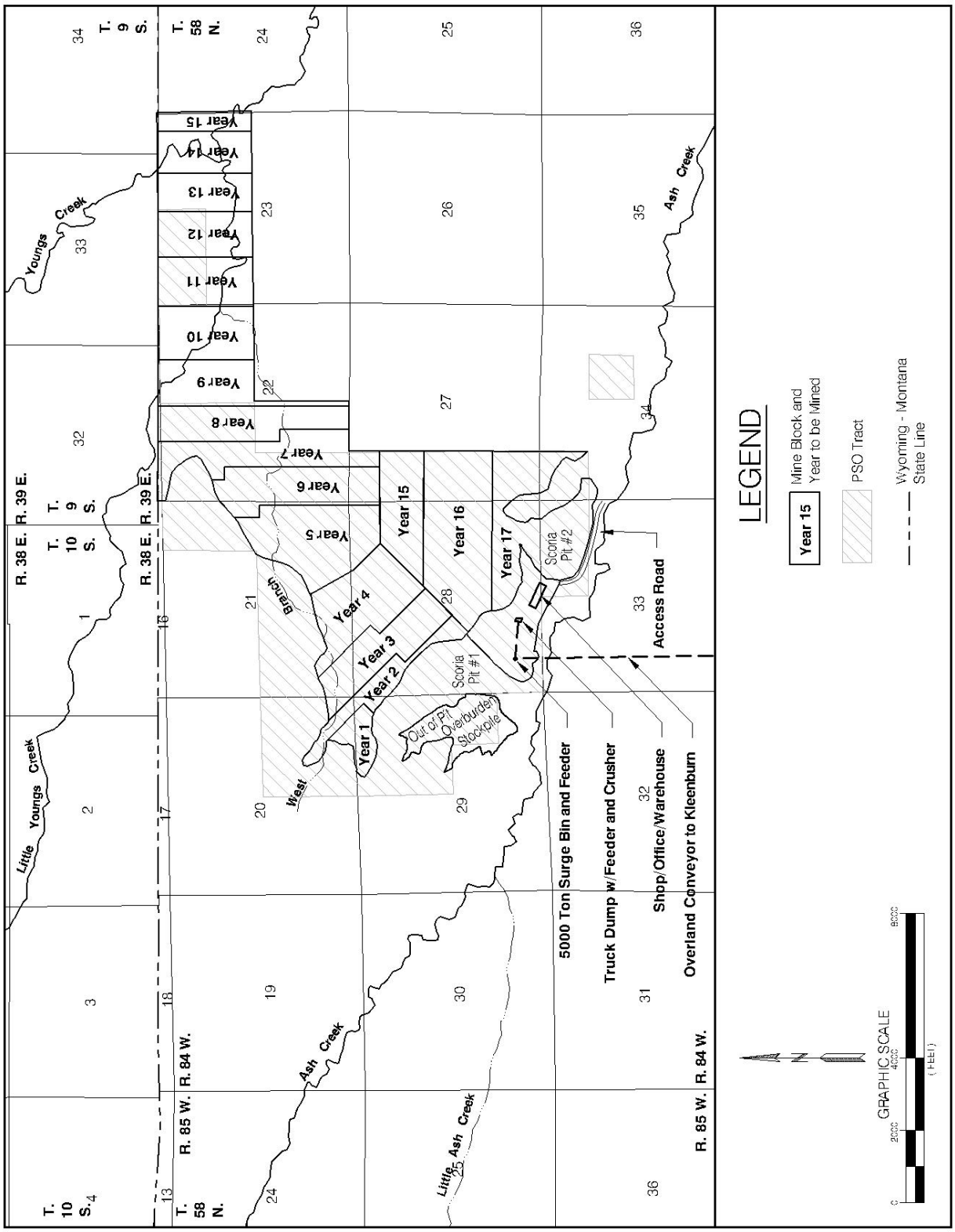

Figure 2-2. Schematic Mine Plan for the Ash Creek Mine.

1,244 acres are on the PSO Tract. P&M assumes that about 95 percent of the mineable coal is recoverable, based on historical recovery factors at typical PRB surface coal mines. This would mean that 145.5 million tons, 107 million tons of which are on the PSO Tract and are now federally owned, would be recoverable over the life of the mine. An estimated total of 356.1 million bank cubic yards of overburden would be excavated.

BLM will independently evaluate the volume and average quality of the coal resources included in the PSO Tract as part of the fair market value determination process. BLM's estimate of the mineable reserves and average quality of the coal included in the tract will be published in the final appraisal. Some coal quality information in the area of the PSO Tract is included in Section 3.4.3 of this document.

The total area of proposed disturbance would be about 2,595 acres. The area of disturbance would exceed the area of coal removal due to incidental disturbances associated with mining the coal such as topsoil buffer areas, scoria mining, grading to blend naturally with reclaimed contours, and surface facilities which could include shop/office/warehouse buildings, truck dump with crushing and feeding equipment, transfer conveyor, surge storage bin and feeder, a 24,000-foot long overland conveyor, rail loop and loadout facility, haul roads and access road.

P&M proposes to utilize shovel and truck equipment similar to those commonly utilized in the industry at other PRB surface coal mines. Typical equipment sizes which could be used would include 240 to 320 ton trucks matched with 60 to 80 ton capacity shovels. These primary equipment units would be used to remove overburden and interburden as well as mine coal. The mine plan layout depicted schematically on Figure 2-2 was prepared by P&M to show recovery of coal within the proposed mine plan area using this equipment. P&M refers to the proposed mine as the Ash Creek Mine for planning purposes.

Mining would begin with a boxcut immediately west of the facilities area and extend across the western portion of the south end of the mining area. Overburden from the boxcut would be placed in an overburden stockpile located adjacent to the south side of the mining area but separated from Ash Creek to control surface water run-off in the area. The boxcut would be opened to establish an operating pit approximately 350 feet wide which would advance in a parallel manner with subsequent cuts. A pit length of approximately 2,500 feet would be maintained. Multiple seams would be mined, and coal would be blended as needed to address customer coal quality constraints.

The proposed mining sequence would allow expansion into adjacent private coal reserves during the later part of the mine life. This private coal is shown being mined in years 9 through 15 of the schematic mine plan shown on Figure 2-2.

Supporting equipment that would be utilized includes motor graders, crawler tractors, water trucks, scrapers, maintenance equipment, pumps, light plants and related equipment common to the industry.

The proposed surface coal mining operation envisioned for the mine would include relatively simple facilities and associated infrastructure. A facilities area would be developed adjacent to Ash Creek along the southeast part of the mining area. This would be an above drainage location to facilitate control of surface water. The site would be protected and not visible from surrounding areas as it would not be above surrounding topography. This would help to mitigate any concerns for visual, noise, or fugitive dust effects from the operation.

Facilities to be located at this site would include a maintenance shop, warehouse, employee bathhouse, and mine office complex as a single building unit. Equipment parking, employee and vendor parking, outside storage, and other improved site areas for fuel storage, equipment "lay-down" and other requirements of a surface coal mining operation would be provided within the facilities area.

The truck dump, crushing, and conveying facilities would be located at this site. A transfer conveyor belt would be used to convey the crushed coal to a 5,000 ton capacity surge bin/silo which would serve as the feed for an overland conveyor.

An overland conveyor would be used to transport coal to a unit train loadout facility on the BNSF mainline due south of the operation. An overland conveyor was selected to minimize disturbance at the site and reduce development costs while maximizing use of existing facilities located near the recently reclaimed Big Horn Coal Company loadout facilities.

A logical production build-up has been developed for the proposed mining operation. Production with opening of the boxcut would begin at one million tons and build over the next three years to a steady-state annual production for the remaining mine life at 10 million tons. This schedule provides for a mine life of 17 years. This level of production approximately matches and maximizes production of overburden from one shovel. A projection of annual production of overburden/ interburden and coal is shown on Table 2-1.

Reclamation activities which would be completed at the mine site include topsoil removal and replacement, drainage and sediment control, backfilling and grading, and seeding and planting according to the regulations of WDEQ/LQD. Topsoil would be removed and stockpiled or directly placed on re-graded surfaces. Once the operation is in a steady-state production condition, topsoil would be directly placed on graded backfill to minimize the need for stockpiling and rehandling.

Table 2-1. Production Schedule

Year	**Production (Millions)**	
	Coal (Tons)	Overburden (bcy)
1	1.0	3.0
2	2.5	5.4
3	5.0	11.4
4	7.0	19.9
5	10.0	27.7
6	10.0	28.1
7	10.0	24.6
8	10.0	22.8
9	10.0	23.3
10	10.0	26.4
11	10.0	23.4
12	10.0	21.7
13	10.0	12.9
14	10.0	12.2
15	10.0	27.1
16	10.0	34.0
17	10.0	32.2
Total	145.5	356.1

Drainage and sediment control structures would be used to control surface water quality at the site. It is assumed that there would be only minor groundwater inflow into the active mine pit and therefore structures would not be required for any groundwater dewatering needs. Several sediment ponds, gravel check dams, grass filters, and other best available control technology structures would be used as required to control surface water quality from mining and reclamation activities.

Grading of backfilled spoil would be completed to establish a postmining surface which would resemble the premining topography and would be approved by WDEQ. The postmining topography would be somewhat lower in elevation than the premining topography due to coal removal. However, given the drainage configuration of the site, positive drainage could be established in the postmining topography with completion of reclamation activities.

The mining and reclamation plan would be reviewed by WDEQ/LQD and P&M would make any changes necessary in order to secure the permit to mine.

The mine would employ about 70 persons at normal operating capacity.

Hazardous and Solid Waste

Solid waste which would be produced at the Ash Creek Mine consists of

floor sweepings, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. The mine would dispose of its solid wastes within its permit boundary in accordance with WDEQ-approved solid waste disposal plans. Sewage generated by mining would be handled by WDEQ-permitted sewage systems to be constructed on site.

Maintenance and lubrication of most of the equipment would take place at the shop facilities. Major lubrication, oil changes, etc., of most equipment would be performed inside the service building lube bays, where waste oil would be contained and deposited in storage tanks. The collected waste oils would then be recycled offsite.

P&M has reviewed the EPA's *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Re-authorization Act* (SARA) *of 1986* (as amended) and EPA's *List of Extremely Hazardous Substances* as defined in 40 CFR 355 (as amended) for hazardous substances which may be used at the Ash Creek Mine. P&M would maintain files containing Material Safety Data Sheets for all chemicals, compounds and/or substances which are or would be used during the course of mining.

P&M would be responsible for ensuring that all production, use, storage, transport, and disposal of hazardous and extremely hazardous materials as a result of mining are in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations, and guidelines. All mining activities involving the production, use, and/or disposal of hazardous or extremely hazardous materials are and would continue to be conducted so as to minimize potential environmental impacts.

P&M would be required to comply with emergency reporting requirements for releases of hazardous materials. Any release of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR 117, would be reported as required by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended. The materials for which such notification must be given are the extremely hazardous substances listed in Section 302 of the *Emergency Planning and Community Right to Know Act* and the hazardous substances designated under Section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is released, immediate notice must be given to the WDEQ Solid and Hazardous Waste Division and all other appropriate federal and state agencies.

Each mining company is expected to prepare and implement several plans and/or policies to ensure environmental protection from hazardous and extremely hazardous materials. These plans/policies include:

- Spill Prevention Control and Countermeasure Plans;
- Spill Response Plans;
- Inventories of hazardous chemical categories pursuant to Section 312 of SARA, as amended; and
- Emergency Response Plans.

All mining operations are also required to be in compliance with regulations promulgated under the Resource Conservation and Recovery Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, and the Federal Clean Air Act. In addition, mining operations must comply with all attendant state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

2.2 Alternative 1

Alternative 1 is the No-Action Alternative. Under the No-Action Alternative, the exchange would not be completed.

For purposes of this analysis, it is assumed that if the No-Action Alternative is selected, the federal coal in the PSO Tract would not be mined in the foreseeable future. Selection of this alternative would not preclude leasing of this federal coal in the future. Under the No-Action Alternative it is also assumed that the Bridger lands, JO Ranch lands and Welch lands would remain in private ownership. The Bridger lands would remain private in-holdings in the BTNF and the BLM Pinedale Field Area. The JO lands, including the JO Ranch buildings, which are eligible for National Historic Site status, would remain private in-holdings in the BLM Rawlins Field Area. The Welch lands, which represent a unique opportunity for public access to the Tongue River in Wyoming outside of the Big Horn National Forest, would remain in private hands. For the purpose of this analysis, no other assumption is made about the future use of these lands. However, based on information P&M has provided, it is likely that these lands would be sold on a competitive bid basis. These sales could result in subdivision and rural development of these lands.

2.3 Alternatives Considered but not Analyzed in Detail

2.3.1 Alternative 2

Alternative 2, which is based on a comment received during the scoping process, assumes that the exchange does not take place and the government purchases the offered lands from P&M. This alternative assumes that P&M would be willing to sell the offered lands for the appraised value. Although P&M has indicated that they would sell the lands on a competitive bid basis if the exchange is not completed, BLM does not have funding or a funding mechanism to acquire these lands through purchase. Therefore, this alternative was not analyzed in detail.

Under this alternative, the U.S. would acquire the P&M tracts. The coal could potentially be leased and mined, but it would not be mined as a result of an exchange. The environmental impacts would be similar to the Proposed Action for the lands to be acquired (Bridger lands, JO Ranch lands and Welch lands) and similar to the No-Action Alternative for the PSO Tract.

2.3.2 Alternative 3

Under Alternative 3 the federal government would hold a competitive lease sale for the coal beneath the PSO Tract and use the revenue generated to purchase the lands offered by P&M.

Since decertification of the Powder River Basin as a coal producing region, federal coal has been leased in response to applications for maintenance tracts to extend the lives of existing mines. The PSO Tract would not be a maintenance tract and BLM has not received an application to lease any of the federal coal included in the PSO Tract.

The revenue that would be generated if the coal was mined would go into the General Fund and could not be diverted from the Treasury to purchase the P&M lands without Congressional action. Therefore, this alternative is not analyzed in detail in this EIS.

The environmental impacts of this alternative would be similar to the environmental impacts of the Proposed Action assuming that the coal would be leased and mined.

2.4 Comparison of Alternatives

The locations of the lands which P&M is offering for exchange for the federal coal included in the PSO Tract are shown on Figures 1-1 through 1-4. The location of the federal coal that P&M would acquire under the Proposed Action is shown on Figure 2-1. Table 2-2 summarizes the lands and minerals that P&M is offering for exchange under the Proposed Action. Table 2-3 compares the Proposed Action and the No Action Alternative (Alternative 1) in terms of projected coal production, surface disturbance, mine life, and federal and state revenues.

Table 2-4 presents a comparative summary of the direct and indirect environmental impacts of implementing the Proposed Action as compared to the No-Action Alternative. Table 2-5 presents a comparative summary of cumulative environmental impacts of implementing each alternative. The environmental consequences of the Proposed Action and Alternative 1 are analyzed in Chapter 4.0.

These summary impact tables are derived from the following explanation of impacts and magnitude. NEPA requires all agencies of the federal government to include, in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on:

(i) the environmental impact of the Proposed Action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the Proposed Action,
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented (42 USC § 4332[C]).

Impacts can be beneficial or adverse, and they can be a primary result of an action (direct) or a secondary result (indirect). They can be permanent, long-term (persisting beyond the end of mine life and reclamation) or short-term (persisting during mining and reclamation and through the time the reclamation bond is released). Impacts also vary in terms of significance. The basis for conclusions regarding significance are the criteria set forth by the Council on Environmental Quality (40 CFR 1508.27) and the professional judgement of the specialists doing the analyses. Impact significance may range from negligible to substantial; impacts can be significant during mining but be reduced to insignificance following completion of reclamation.

Table 2-2. Summary Comparison of Lands and Minerals Offered for Exchange by P&M

Tract	Proposed Action			No Action Alternative	
	Surface Estate (acres)	**Mineral Estate (All Minerals) (acres)**	**Mineral Estate (Coal Only) (acres)**	**Surface Estate (acres)**	**Mineral Estate (acres)**
Bridger	3,086.25	3,086.25	0.00	0.00	0.00
JO Ranch	1,236.47	0.00	0.00	0.00	0.00
Welch	1,600.41	0.00	800.00	0.00	0.00
TOTAL	5,923.13	3,086.25	800.00	0.00	0.00

Table 2-3. Summary Comparison of Coal Production, Surface Disturbance, and Revenues for the PSO Tract

Item	Proposed Action	No Action Alternative
Mineable Federal Coal	112.5 million tons	none
Recoverable Federal Coal	107.0 million tons	none
Area of Federal Coal Exchanged	2,045 acres	none
Area of Federal Coal to be Mined	1,244 acres	none
Total Area to Be Disturbed by Coal Mining[1]	2,595 acres	none
Average Annual Coal Production	10 million tons	none
Average No. of Employees	70	none
Total Projected State Revenues[2]	$ 80.25 million	none
Total Projected Annual Revenues to Sheridan County[3]	$ 6 million	none

[1] Includes disturbance due to mining, overburden stockpiling, construction of surface facilities, scoria mining and related disturbance.

[2] Projected revenue to State of Wyoming is $0.75 per ton of coal sold and includes income from severance tax, property and production taxes, sales and use taxes, and exclude Wyoming's share of federal royalty payments (University of Wyoming 1994) (refer to Section 4.4.19 of this EIS). Figures are for PSO Tract only.

[3] Based on a coal price of $8.00 per ton and production rate of 10 million tons per year, including coal from PSO Tract and adjacent privately owned coal in mine plan area. Includes counties' share of severance taxes, property taxes, sales and use taxes.

Table 2-4. Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange.

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
	BRIDGER LANDS	
TOPOGRAPHY AND PHYSIOGRAPHY, GEOLOGY AND MINERALS, SOILS, AIR QUALITY, WATER QUALITY, ALLUVIAL VALLEY FLOORS, WETLANDS, VEGETATION, WILDLIFE, THREATENED, ENDANGERED AND CANDIDATE SPECIES, RESOURCES, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, PALEONTOLOGICAL RESOURCES, VISUAL RESOURCES, NOISE, TRANSPORTATION FACILITIES	Negligible, beneficial permanent on Bridger land. Lands would become public lands. USFS and BLM would manage surface and mineral resources in accordance with existing land use plans. No change in management anticipated.	Nature, extent and duration of impacts would depend on private landowner. Lands would remain private lands. Resources could be affected by any development conducted by private landowner.
LAND USE AND RECREATION	Moderate, beneficial and adverse permanent on Bridger lands. Public access would be ensured. Private grazing leases would be lost.	Nature, extent and duration of impacts would depend on private landowner. Lands would remain private lands. Public access would not be ensured. Status of grazing leases would not change.
	JO RANCH LANDS	
TOPOGRAPHY AND PHYSIOGRAPHY, GEOLOGY AND MINERAL, SOILS, AIR QUALTIY, ALLUVIAL VALLEY FLOORS, WETLANDS, NATIVE AMERICAN CONCERNS, PALEONTOLOGICAL RESOURCES, VISUAL RESOURCES, NOISE, TRANSPORTATION FACILITIES	Negligible, beneficial permanent on JO Ranch lands. Lands would become public lands. BLM would manage surface resources in accordance with land use plans which would be revised to address management of these lands.	Nature, extent and duration of impacts would depend on private landowner. Lands would remain private lands. Resources could be affected by any development conducted by private landowner.
WATER RESOURCES, VEGETATION, WILDLIFE, THREATENED, ENDANGERED AND CANDIDATE SPECIES, LAND USE AND RECREATION, CULTURAL RESOURCES	Moderate, beneficial and adverse permanent on JO Ranch lands. BLM would manage surface resources in accordance with land use plan. Management of Cow Creek riparian area, JO Ranch buildings, and sand hills habitat would be addressed in land use plan change. Public access would be ensured. Private grazing leases would be lost.	Nature, extent and duration of impacts would depend on private landowner. Lands would remain private lands. Resources could be affected by any development conducted by private landowner. Public access would not be ensured. Status of grazing leases would not change.

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-4 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
	WELCH LANDS	
TOPOGRAPHY AND PHYSIOGRAPHY, GEOLOGY AND MINERALS, SOILS, AIR QUALITY, WATER RESOURCES, ALLUVIAL VALLEY FLOORS, WETLANDS, VEGETATION, WILDLIFE, THREATENED, ENDANGERED AND CANDIDATE SPECIES, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, PALEONTOLOGICAL RESOURCES, VISUAL RESOURCES, NOISE, TRANSPORTATION FACILITIES	Neglibile, permanent on Welch lands. Lands would become public lands. BLM would manage surface resources in accordance with land use plans which would be amended to address management of these lands.	Nature, extent and duration of impacts would depend on private landowner. Lands and minerals other than coal would remain private. Resources could be affected by any development conducted by private landowner.
LAND USE AND RECREATION	Moderate, beneficial and adverse permanent on Welch lands. BLM would manage surface and coal resources in accordance with land use plan. Public access would be ensured. Existing uses could continue. Other land uses would be evaluated in land use plan amendment. Private grazing leases would be lost.	Nature, extent and duration of impacts would depend on private landowner. Lands and minerals other than coal would remain private. Resources could be affected by any development conducted by landowner. Public access would not be ensured. Status of grazing leases would not change.
	PSO TRACT	
TOPOGRAPHY & PHYSIOGRAPHY		
PERMANENT TOPOGRAPHIC MODERATION could result in:		
Microhabitat reduction	Moderate, long term on mine area	none
Habitat diversity reduction	Moderate, long term on mine area	none
Reduction in water runoff and peak flows	Moderate, long term on mine area	none
Increased precipitation infiltration	Moderate, long term on mine area	none
Wildlife carrying capacity reduction	Moderate, possibly short term on mine area	none
Reduction in erosion	Moderate, long term on mine area	none
Enhanced vegetative productivity	Moderate, beneficial, long term on mine area	none
Potential acceleration of groundwater recharge	Moderate, long term on mine area	none

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-4 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
GEOLOGY AND MINERALS		
SUBSURFACE changes would result in:		
Removal of coal	Moderate, permanent on mine area	none
Removal and replacement of topsoil and overburden	Moderate, long term on mine area	none
Physical characteristic alterations in geology	Moderate, permanent term on mine area	none
Loss of CBM[3]	None	none
SOILS		
CHANGES IN PHYSICAL PROPERTIES would include:		
Increased near-surface bulk density	Moderate, long term on mine area	none
More uniformity in soil type, thickness, and texture	Moderate, beneficial, long term on mine area	none
Increased uniformity in mixed soils (e.g., texture)	Moderate, beneficial, long term on mine area	none
Decreased soil loss due to topographic modification	Moderate, beneficial, long term on mine area	none
CHANGES IN CHEMICAL PROPERTIES would include:		
Uniform soil nutrient distribution	Moderate, beneficial, long term on mine area	none
CHANGES IN BIOLOGICAL PROPERTIES would include:		
Organic matter reduction	Moderate, long term on mine area	none
Microorganism population reduction	Moderate, long term on mine area	none
Existing plant habitat reduction in soils stockpiled before placement	Moderate, long term on mine area	none
AIR QUALITY		
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:		
Elevated concentration levels of TSP	Moderate, short term on mine area	none
Elevated concentrations of gaseous emissions	Moderate, short term on mine area	none
WATER RESOURCES		
SURFACE WATER		
CHANGES IN RUNOFF CHARACTERISTICS AND SEDIMENT DISCHARGE would include:		
Disruption of surface drainage systems	Moderate, short term on mine area	none
Increased runoff and erosion rates	Moderate, short term on mine area	none
Increased infiltration	Moderate, long term on mine area	none
Reduction in peak flows	Moderate, long term on mine area	none

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.
[3] Most of the CBM reserves could be recovered prior to initiation of mining activitiy, those reserves

Table 2-4 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
WATER RESOURCES (continued)		
GROUNDWATER		
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:		
Removal of coal and overburden aquifers	Negligible, short term on mine area	none
Replacement of existing coal and overburden with spoil aquifers	Negligible, long term on mine area	none
Depressed water levels in aquifers adjacent to mines	Moderate, short term on mine area	none
Change in hydraulic properties	Negligible, long term on mine area	none
Change in groundwater quality in backfilled areas	Moderate, long term on mine area	none
ALLUVIAL VALLEY FLOORS		
While a final determination has not been made by WDEQ/LQD, it is believed that proposed mining operations would not affect AVFs significant to agriculture	No impact to AVFs significant to farming on proposed mine area. AVFs not significant to farming would be restored if affected.	none
WETLANDS		
Removal of all existing wetlands	Wetlands on disturbed areas would be mined and reclaimed	none
VEGETATION		
PROGRESSIVE REDUCTION IN NATIVE VEGETATION would result in:		
Increased erosion	Moderate, short term on mine area	none
Wildlife and livestock habitat loss	Moderate, short term on mine area	none
Wildlife habitat carrying capacity loss	Moderate, long term on mine area	none
AFTER RECLAMATION the following could result:		
Changes in vegetation patterns	Negligible, long term on mine area	none
Reduction in vegetation diversity	Negligible, long term on mine area	none
Reduction in shrub density	Negligible, long term on mine area	none

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-4 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
WILDLIFE		
DURING MINING the following could occur:		
Wildlife displacement	Moderate, short term on mine area	none
Pronghorn passage reduction	Moderate, short term on mine area	none
Increased mortality rate to small mammals	Moderate, short term on mine area	none
Temporary displacement of small mammals	Moderate, short term on mine area	none
Sage grouse habitat removal	Negligible, short term on mine area	none
Abandonment of raptor nests	Negligible, short term on mine area	none
Foraging habitat reduction for raptors	Negligible, short term on mine area	none
Loss of nesting and foraging habitat for MBHFI	Negligible, short term on mine area	none
Reduction in waterfowl resting and feeding habitat	Negligible, short term on mine area	none
Loss of songbird foraging habitat	Moderate, short term on mine area	none
Temporary wildlife habitat loss	Negligible, short term on mine area	none
Continued road kills by mine-related traffic	Negligible, short term on mine area	none
THREATENED, ENDANGERED AND CANDIDATE SPECIES		
MINING IMPACTS could result in:		
Loss of black-footed ferret colonies	No impacts on mine area	none
Loss of bald eagle nesting and foraging habitat	Negligible, short term on mine area	none
Loss of Ute Ladies-tresses orchid habitat	Negligible on mine area	none
Loss of mountain plover habitat	None	none
Loss of black-tailed prairie dog colonies	Colonies within mine disturbance area would be destroyed by mining	none
LAND USE AND RECREATION		
ENVIRONMENTAL CONSEQUENCES ON LAND USE would be:		
Reduction of livestock grazing	Moderate, short term on mine area	none
Loss of wildlife habitat	Moderate, short term on mine area	none
Curtailment of oil and gas development	Moderate, short term on mine area	none
Loss of public land available for recreation activities[3]	Negligible, short term on mine area	none
Loss of CBM reserves[4]	Moderate, permanent on mine area	none
CULTURAL RESOURCES		
19 sites not eligible or recommended not eligible for NRHP	Impacts to eligible or unevaluated sites are not	none
2 recommended eligible for NRHP	permitted; any site eligible for the NRHP would be avoided or mitigated through data recovery	none
Possible increase in vandalism	No impacts on mine area	none
Possible increase in unauthorized collecting	No impacts on mine area	none

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.
[3] Lands to be mined are all privately owned. The exchange would bring 6,068 privately owned acres into public ownership.
[4] Most of the CBM reserves could be recovered prior to initiation of mining activity, those reserves not recovered prior to mining would be lost.

Table 2-4 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts[2] for the Proposed Action, and the No-Action Alternative for the P&M Exchange (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
NATIVE AMERICAN CONCERNS	No impact identified on mine area	none
PALEONTOLOGICAL RESOURCES		
Overburden removal could expose fossils for scientific examination	No impact identified on mine area	none
VISUAL RESOURCES		
EVIDENT IMPACTS DURING MINING would include:		
Alteration of landscape classified by the BLM as VRM Class II	Negligible, short term on mine area	none
IMPACTS FOLLOWING RECLAMATION could be:		
Smoother sloped terrain	Negligible, long term on mine area	none
Reduction in sagebrush density	Negligible, short term on mine area	none
NOISE		
INCREASED NOISE LEVELS could affect:		
Nearby occupied dwellings	Negligible, short term on mine area	none
Wildlife in immediate vicinity	Negligible, short term on mine area	none
TRANSPORTATION FACILITIES		
Increase in coal shipped on existing railroads	Negligible, short term on mine area	none
New employees travel on highways for duration of mining operations	Negligible, short term on mine area	none
Relocation of pipelines	Potential moderate, short term on mine area if	none
Relocation of utility lines	CBM developed prior to mining	
	No impact on mine area	none
SOCIOECONOMICS		
EFFECTS DURING MINING would include:		
Employment Potential (Up to 70 jobs in mine area is expected)	Moderate, beneficial short term on mine area	none
Revenues from royalties and taxes to the state government	Moderate, beneficial short term on mine area	none
Revenues from royalties and taxes to the federal government	No impact on mine area	none
Economic development	Moderate, beneficial short term on mine area	none
Population in Sheridan County	No impact on mine area	none

[1] Refer to Sections 4.0 through 4.5 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-5. Summary Comparison of Magnitude and Duration of Cumulative Impacts.[1, 2]

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
TOPOGRAPHY & PHYSIOGRAPHY		
REDUCED RELIEF AND SUBDUED TOPOGRAPHY could result in:		
Reduction in topographic diversity	Negligible, long term on mine areas	none
Increased precipitation infiltration	Negligible, long term on mine areas	none
Biodiversity reduction	Negligible, long term on mine areas	none
Big game carrying capacity reduction	Negligible, long term on mine areas	none
GEOLOGY AND MINERALS		
RECOVERY OF COAL would result in:		
Stabilization of municipal, county and state economies	Significant, beneficial, short term on mine areas	none
SOILS		
RECLAIMED SOILS could result in:		
Increased soil productivity	Negligible, long term on mine areas	none
Reduced erosion	Negligible, long term on mine areas	none
AIR QUALITY		
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:		
Elevated concentration levels of TSP	Negligible, short term on mine areas	none
Elevated concentrations of gaseous emissions	Negligible, short term on mine areas	none
WATER RESOURCES		
SURFACE WATER		
IMPACTS TO SURFACE WATER could result in:		
Temporary reduction in soil infiltration rates and increased runoff	Negligible, short term on mine areas	none
GROUNDWATER		
IMPACTS ON GROUNDWATER could result in:		
Replacing coal aquifers with spoil aquifer	Negligible, long term on mine areas	none
Drawdown in the coal and alluvial aquifers in surrounding areas	Negligible, short term on mine areas	none
Water-level decline in the sub-Dietz 3 coal aquifers	Negligible to moderate, short term on mine areas	none
Change in groundwater quality as a result of mining	Negligible, long term on mine areas	none
ALLUVIAL VALLEY FLOORS	No cumulative impacts anticipated on mine areas	none
WETLANDS		
Removal of existing wetlands	Wetlands on mine areas would be mined and reclaimed	none

[1] Refer to Section 4.8 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-5 Summary Comparison of Magnitude and Duration of Cumulative Impacts[1, 2] (Continued)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
VEGETATION		
SURFACE DISTURBANCE would result in:		
Loss of common native vegetation types for wildlife	Negligible, short term on mine areas	none
Regional loss of vegetative diversity	Negligible, long term on mine areas	none
WILDLIFE		
IMPACTS ON WILDLIFE FROM SURFACE MINING could result in:		
Loss of pronghorn habitat	Moderate, short term on mine areas	none
Mule deer and white tail deer population reduction	Negligible, short term on mine areas	none
Reduction in raptor nesting sites and foraging habitat	Negligible, short term on mine areas	none
Reduction in sage grouse leks	Negligible, short term on mine areas	none
Loss of nesting and foraging habitat for MBHFI	Negligible, short term on mine areas	none
Reduction in waterfowl habitat	Minor, short term on mine areas	none
Permanent reduction in wildlife habitat diversity	Major, long term on mine areas	none
Permanent reduction in some wildlife carrying capacity	Major, long term on mine areas	none
THREATENED, ENDANGERED AND CANDIDATE SPECIES		
No significant cumulative impacts to T&E species are projected	Negligible, short term on mine areas	none
LAND USE AND RECREATION		
IMPACTS ON LAND USE could result in:		
Loss of agricultural production	Moderate, short term on mine areas	none
Disruption of oil and gas development/production	Moderate to significant, short term on mine areas	none
Reduction of wildlife habitat	Moderate, short term on mine areas	none
IMPACTS ON RECREATION could result in:		
Loss of access to lands used by recreationists, particularly hunting	Moderate, short term on mine areas	none
CULTURAL RESOURCES	Sites eligible for NRHP would be mitigated on mine areas	none
NATIVE AMERICAN CONCERNS	No impact identified on mine areas	none
PALEONTOLOGICAL RESOURCES	No impact identified on mine areas	none
VISUAL RESOURCES		
Impacts on visual resources by mining activities	Moderate, short term on mine areas	none
NOISE	No impact anticipated outside of mine areas	none

[1] Refer to Section 4.8 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-5 Summary Comparison of Magnitude and Duration of Cumulative Impacts[1, 2] (Continued)

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**PROPOSED ACTION**	**NO ACTION ALTERNATIVE**
TRANSPORTATION FACILITIES		
Continued use of existing transportation facilities	Negligible, short term on mine area	none
SOCIOECONOMICS		
IMPACTS ON SOCIOECONOMICS could include:		
Mineral and energy related development	Moderate, beneficial, short term on mine areas	none
Employment	Significant, beneficial, short term on mine areas	none
Housing market	Significant, short term due to mines	none
Economic development	Significant, beneficial, short term due to mine areas	none
Revenues and royalties	Significant, beneficial, short term due to mine areas	none

[1] Refer to Section 4.8 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.